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The American Horologist

IN THE INTEREST OF THE HOROLOGICAL AND JEWELRY INDUSTRY

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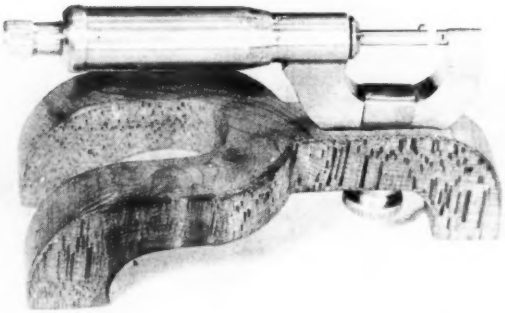

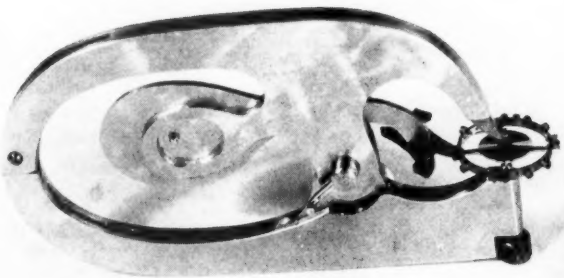

Vol. V AUGUST, 1940 No. 8

The American Horologist

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THE AMERICAN HOROLOGIST

Published monthly by Roberts Publishing Company, Denver, Colorado, in the interest of Horological and Jewelry Industry. To inculcate the principles of Fraternal and Commercial Advancement; to promote the welfare and enhance the betterment of the industry; to cultivate good fellowship and a higher degree of knowledge in Horology and Jewelry industry.

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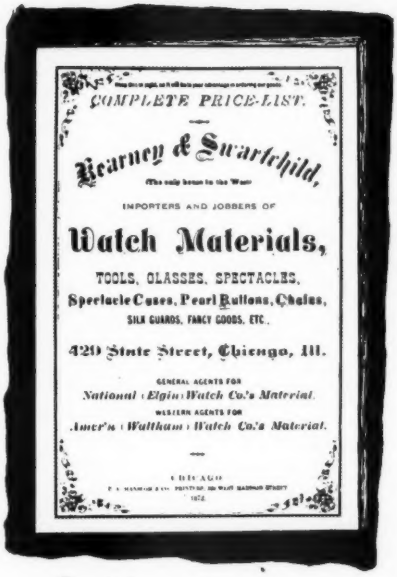

CATALOGUE of 1872

70 Years of Service and Progress

The above illustration shows Swartchild's First Catalogue, published in 1872, shortly after the famous Chicago Fire and two years after the company was founded. This book was the beginning of a long and famous series of publications which have grown to contain 661 large pages, as does the last edition.

Seventy years have passed since the founding in 1870 of what was to become the World's largest Watchmakers' and Jewelers' Supply House. Down through the years the company has maintained its position of Leadership in the industry and the Confidence of its thousands of customers.

1870-1940

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19 JEWELS

IN THE DISTINGUISHED NEW "DEMI" SIZE

● You'll find it hard to spare the superlatives when you see these newest Lady Elgins. Doubly hard when you see how quickly they rouse buying enthusiasm among your customers and prospects.

The new "Demi" size is one of the most exciting things that has happened this season. It opens the way to far more interesting styling. And for it Elgin's celebrated craftsmen and scientists have developed a new movement of remarkable accuracy.

Each "Demi" size Lady Elgin is timed right in the great Elgin Observatory. Prices start at $50.00.

Copr. 1940 by Elgin National Watch Company, Elgin, Ill.

4202A—14K natural gold case. High curved crystal. $60.00

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THEY ASSURE BOTH PRESTIGE AND PROFIT

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21 JEWELS

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● Your prestige is what your merchandise makes it. These watches bring you true prestige—and a splendid profit.

There's your number one reason for stocking and pushing the new Lord and Lady Elgins. Your customers and prospects will be getting the news about these remarkable timepieces through the pages of leading magazines month after month.

One glance tells you how salable the new models for men are. Plenty of rosé cases to choose from . . . interesting dials . . . dome and high-curved crystals. And with every watch the Elgin Observatory Certificate, vouching for its proved timekeeping ability. Stock up and feature them now at prices from $50.00.

ANRJA—NACJ Convention visitors: enjoy a visit to the Elgin Exhibit, booth numbers 59, 60, 71, 72.

Organization

By D. L. THOMPSON

Our National Association of Watchmakers, the United Horological Association of America, Inc., is now in its seventh year and has shown a steady growth from a nucleus of a few men who were imbued with the idea that the jewelry industry could be put in step in the march of progress seen in other industries by bringing together the watchmakers of our country, who form the vast majority of the workers in the jewelry industry, into state associations and then into a national association, through which they could work in harmony.

From these few men of vision, honor, integrity and vigor our association membership has grown to thousands who have found it a privilege and a pleasure to be associated with their fellow-craftsmen in an old industry that is ever new and who are working together to eliminate evils which have lowered its prestige and profits.

At the present time there are 23 State Associations on the affiliated membership roster of the United Horological Association of America and there are members in all states of the Union and in 3 territorial possessions. Our association monthly organ, the American Horologist, which is published in the interest of all engaged in the jewelry industry, goes to 14 foreign countries and to thousands of other readers who are not members of the association. It prints the collective thought of American watchmakers and it has had a great part in the progress we have so far made towards the objective above stated.

There have been other organizations of watchmakers of state and national character, with able leaders and intelligent memberships, who have been unable to keep their associations alive for the simple reason that there was no unity of purpose and action, no clear understanding among the rank and file of the memberships of the part each was to play, and no method of getting that information to them.

The past leaders of our association have been able men, who have done an admirable job of guiding an intelligent membership, asking and securing the advice of that membership frequently, through the guilds of watchmakers and associated workers in the jewelry industry, and has passed on, through our national secretary and our organization monthly organ, these thoughts to all our guilds and to the industry generally. As a result, our organization has grown by leaps and bounds and is strong and healthy and has had a great part in the accomplishment of several reforms which were badly needed, all of which is familiar to those who have attended our guild meetings regularly or have been regular readers of our monthly publication.

When we speak of our past leaders, we include all officers of the National Association, the State Associations, and, last but not least, those men who are in closest contact with the membership and who play the part which will make or break the organization, the Guild officers, who hold, in many cases, posts in state and national associations with such commendable ability.

As we enter our seventh year we do so with new officers but not new leaders as all of our officers have come up through the ranks where they have been schooled for leader-

ship and are ready for the task of carrying forward our ideas, building up the organization, and holding before the membership those objectives which have not as yet been reached, and who know that with clarity of purpose and close contact in our ranks we will accomplish what we have set out to do.

It has been demonstrated that officers alone who do not have the whole-hearted support of the members of their organizations can do very little that is of benefit to their cause. Each member should always consider himself as a part of the whole in relation to their organization for without the aid and council of each member there can be no live association and no benefits commonly derived from association with his fellow-craftsmen.

Let us all devote ourselves to the task which we have assigned to our officers and give them a full measure of our support when called upon at any time for advice and assistance or to serve as officers or committeemen, to do our duty without reluctance and with the thought in our minds that we are doing no more than we expect other members to do for our association and for the welfare of all engaged in the jewelry industry.

Nothing contributes more to interest and accomplishment in association work than a willingness to serve on committees, hold the chairs of the guild in rotation, serve as delegates to state and national conventions, and serve in other ways whenever opportunity comes. You will not receive much money for this in any association which is organized on a non-profit basis, such as your national association of watchmakers the United Horological Association of America, but you will be more than repaid in other ways, chief among them in the affection and esteem of your fellow members.

Watchmakers' Registration

In last month's issue of our magazine, a plan of classification of watchmakers was announced.

Such a registry has been under consideration by your National office for the last year and with the cooperation of your Executive Committee and the Technical Advisory Board, this survey was completed January 1st and the plan presented to the War and Navy Departments for their opinion and approval. This was immediately given, their planning boards stating that such a registry would be of inestimable value in a national emergency and requested that we proceed along the lines of our survey.

The Horological Institute of America, in a fine spirit of cooperation, has agreed to make a similar survey of Junior and Certified watchmakers and any others who may wish to be included. Unfortunately of necessity, their list must be confined to the mere factual status of the watchmaker as they stated in their recent journal that they can not receive applications but the individual must deal directly with the government bureaus or commercial companies.

Your Executive Board believes that a registry in itself is not at all adequate for a national emergency but any program developed, should be much broader in its scope and include, not only actual contact with the government agencies but also private companies as well as cooperation with all the industrial planning boards of the national defense program, consequently, we are now in touch with Chairman Kuntsen, the Civilian Defense Commission, with the ultimate idea of co-ordination of our plans with theirs.

It is further planned, through our State Associations and local Guilds, to have contact with officials of the military and naval bases and the industrial groups in their immediate locality for the purpose of the full

development of this program, including the establishment of schools where practical instruction can be given.

This is not only our patriotic duty but with our extensive connections and freedom of action, we are the logical organization to accomplish this stupendous task. We also feel confident that the value of this program will extend beyond the present emergency, as these contacts with both the government and private industry, the experience the watchmaker gains in the manufacture and servicing of precision instruments, will open up a new field to his ultimate advancement.

This fits in with our program of education, legislation and the support of all measures for the ethical advancement of our profession.

Send now for our Official Registration Questionnaire Blank, 3236 East Colfax Avenue, Denver, Colorado.

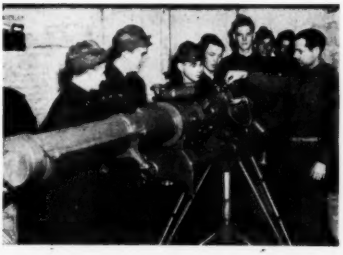
Precision Instruments

Vital to National Protection, Instruments of every known type need trained eyes and hands. Time is man and industry's most important issue. UHAA educational program is of vital importance to you. Your Guild should enroll now. Send for details of this new program.

The "brains" of an anti-aircraft battery is the director instrument, shown here in operation. The men at the tracking telescopes follow the target—one vertically, the other horizontally. A height finder, nearby, electrically transmits the altitude of the target to the director, which continuously computes and transmits to the guns the position at which the projectile and target should meet.

Special theodolite type recording movie cameras are used to check the position of the shell bursts with reference to the target. These cameras run about 11 frames of film per second. The cameras are controlled by a "timer-synchronizer" metronome so that the films can be matched to the fraction of a second after the shooting is over.

In back of every gun is a timekeeper, who determines the rate of speed of fire. There are four guns to each anti-aircraft battery. If the rate of fire falls below 20 shots a minute, the battery is penalized on its score. These guns can fire better than 30 shots a minute. The timing officer carries two stop watches—one for a "spare."

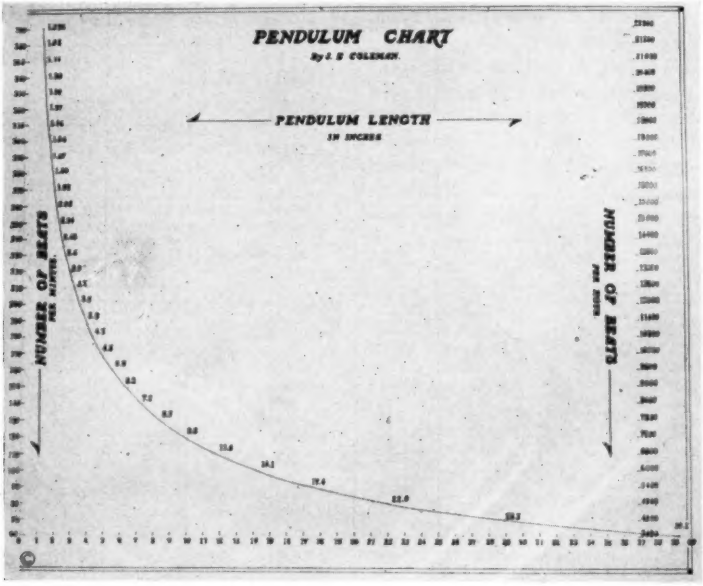


Indoor instruction is also given on the height finder. All instruments used in anti-aircraft firing are precision type, requiring expert treatment. The most important man on a height finder is the "stereoscopic observer." It is by exercise of his sense of stereoscopic vision that this instrument determines the range of the target and converts it into altitude. Comparatively few men possess this quality to the extent of being able to operate a height finder accurately.

"Supplying a New Pendulum Rod"

By J. E. COLEMAN,
U. H. A. A. Technical Board

Most French clocks we meet over the repair bench have stamped upon the right side of the back plate, the length of the pendulum, in inches; American clocks are not so stamped or marked, and it seems to be the rule and practice of repairmen when supplying a new pendulum rod to American clocks to follow the "trial and error" method. In other words, put on one just as long as the case will permit and bring the clock to time by clipping the wire rod until the proper length is reached. Not only is this a long-drawn-out process, but it is unnecessary when one can so easily determine the proper length by a simple calculation.



It takes but a short time to count the train, or, since most American clocks have a verge that is easily removed, we may let the train run through one full hour of the minute hand, counting the revolutions of the escape wheel. Multiply the number of revolutions by the number of the teeth in the escape wheel and multiply that number by two, gives the correct number of beats per hour.

The time of the vibrations of pendulums are in direct ratio to the square roots of their lengths, and the number of vibrations made in any given time, are in the inverse ratio of the square roots of their lengths. Thus we may use the following rule and calculate any desired pendulum: Multiply the number of vibrations made in a minute by the second's pendulum (60), by itself, which is squaring it. Multiply this by the length, 39.2 inches for the standard pendulum, divide this last product by the square of the number of vibrations per minute of the pendulum required and the quotient will be the length of that pendulum in inches and decimal parts.

Example: The pendulum you re-

quire must beat 120 times per minute, how long must you make it?

60x60 equals 3,600.

120x120 equals 14,400.

14,400 : 39.2 :: 3,600 : ?

3,600x39.2 equals 141,120.0.

141,120.0 divided by 14,400 gives 9.8 inches, the length required.

J. E. COLEMAN

Since squaring the number of beats of the second's pendulum and multiplying by its length of 39.2 always gives you 141,120.0, it will not be necessary to do that again; simply take that number as a constant and divide it by the square of the given number of vibrations per minute, to obtain the length of any pendulum required.

Example: Suppose you have a clock whose escape wheel contains 30 teeth, and turns 90 times per hour, to supply a pendulum; how long should it be?

90 revs. divided by 60 equals 1.5 revs. per minute.

1.5 revs. x 30 teeth equals 90 beats per minute.

90 squared equals 8,100.

8,100 divided into our constant, 141,120.0, equals 17.42 inches, the length of pendulum to beat 90 times per minute.

The photo shows the pendulum plotted on a graph; from the standard, or second's pendulum, 39.2 inches long, down to a pendulum 1.030 long, which beats 370 times per minute, or 22,200 times per hour. This chart shows the number of beats per minute on the left and the number of beats per hour in the right column, advanced by steps of ten beats per minute, and may be used for determining the length of pendulum rods in the repair shop since the screw raising and lowering the pendulum ball gives quite a bit of latitude.

Clockmakers Examination

A National Contest just completed and judged.

This contest started last year and has continued until March, 1940. One hundred and fifty clockmakers questions were in the examination. These questions were compiled by the U. H. A. A. National Technical Board and represent the most accurate and sensible compilation of practical questions and answers ever assembled.

Of the many contestants, four highest are herewith listed and their percentages are to be complimented as the questions were not so easy.

Mr. M. L. King, Ottumwa, Iowa, 86.9 per cent.

Mr. C. W. Densmore, Philadelphia, Pa., 82.1 per cent.

Mr. O. F. Snow, Orleans, Mass., 82.1 per cent.

Mr. H. Gruninger, East Detroit, Mich. 82.6 per cent.

J. E. Coleman, Chairman of Judges.

Early American Clock Dials

The duplication, repair or refinishing our specialty. Estimates cheerfully given.

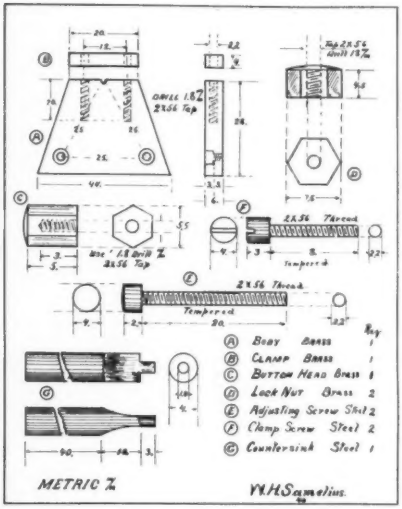
J. E. COLEMAN

50 Arcade Bldg. Nashville, Tenn.

Screwhead Finishing Tool

By W. H. SAMELIUS, *Director*
Elgin Watchmakers College

While screwhead finishing tools may be purchased through our supply houses, it is interesting and educational as well as a pleasure to use a tool made by yourself. The time spent will be paid for many times over from the training and education derived from reading the blueprint and working to exact dimensions. Following the dimensions as given in the accompanying drawing, will give you a good practical tool. The only special tools required will be a No. 49 twist drill, a 2x56 tap and die, which can be secured from your local hardware store or machinist supply house.

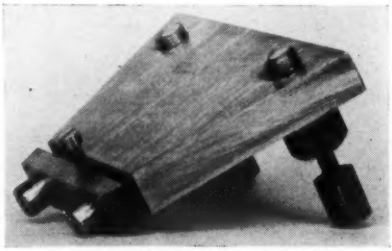


The countersink, as illustrated, can easily be made up by hand. It is to be hardened and drawn to a straw color.

The leveling and clamp screws are to be made from drill rod, hardened and drawn to a blue color.

This screwhead finishing tool can be used for various purposes besides polishing the screwhead flat. It can be used for holding clock pallets, where the impulse face requires refinishing. It can also be used for repolishing springs by cementing the spring directly to the face of the tool and adjusting the leveling screws to the same height as the thickness of the spring. It can also be used for many other operations that the watchmaker is called on when refinishing various parts of our complicated watches.

A good way to polish the screwhead is first to know the screw has been hardened and tempered to a blue. The screw is then fastened into the tool bringing the leveling screws to the same height as the



screw head projects above the surface of the tool. A flat piece of plate glass is charged with a small quantity of oilstone powder and oil and with a circular motion, grind the screwhead so it is dead flat, having a gray finish.

Then on a flat lead block, consisting of pure lead and 5 per cent tin, we apply a small quantity of diamontine and oil. With the finger tip, rub the diamontine into the lead until a black surface appears. The diamontine on the lead must be rather dry in order to get the best results. Carefully cleaning out screwhead and screw from all abrasive matter, we then polish the screwhead, applying a slight pressure while going through a circular motion. The whole operation of polishing the screwhead should not take over five minutes.

Indiana State Board of Examiners in Watch Repairing

Lower row, seated: Raymond B. Medlock, J. L. Hunnicutt, Herman L. Lodde and A. S. Rome. Upper row, standing: Luman B. Mommer and Victor W. Raab. The Governor recently reappointed Mr. J. L. Hunnicutt of Rockville for a four-year term.

SPEND YOUR 1941 VACATION AT THE U. H. A. A. CONVENTION IN AIR-CONDITIONED DULUTH, MINNESOTA, JUNE 22, 23, 24.

It's New . . .

The PRESTO

HAND REMOVER AND CANNON PINION REMOVER

Each $3.50

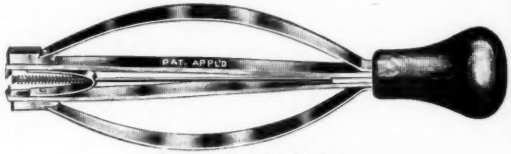
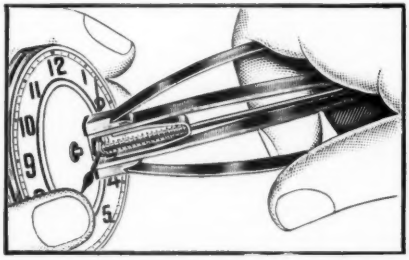


Illustration Is 3/4 Size



The Presto Hand Remover is new in theory and design. Invented and manufactured by an experienced watchmaker, the tool is thoroughly practical.

In removing the hand from a watch, as illustrated, a slight pressure on the spring sides of the tool closes the points as they slide back. The arms resting on the dial have fibre tips and will not mar the dial. The plunger holds the hands firmly against the points so they will not fall off and become lost.

In removing the cannon pinion, this new tool gives a firm, straight pull and eliminates breaking the pinion.

Because of its new style construction the tool can be held up under the eye loupe for a closer view of the work.

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THE NEWALL MFG. CO.

Newly Designed, Large Clear Vision Direct Reading DIAL.

YOU SEE! YOU HEAR! YOU RECORD!

Here it is. Light Brown crackle finish. Size 11x17x10 inches high.

THE PEAK OF WATCH TIMERS

A New Power of Scientific Accuracy for More Business and More Profit.

Like the absolute power that holds the stars of the Universe in their absolute course, this crystal, from the same law of nature, gives precision results, never attained before, closer than any watch, fork, or precision pendulum.

PREPARE YOURSELF FOR YOUR GREATEST BUSINESS, JUST AHEAD.

Dial gives quick, split-second accuracy, with time comparison accuracy far beyond the need for any watch timing comparison.

You have the Peak of all watch timers. Sturdy construction, everlasting. No master watch, no winding. No fork, no tuning. No pendulum, no bother. You have a permanent, accurate crystal control with dial reading beyond compare.

The Paulson was the first timing machine advertised to the trade. It has kept up with the latest developments. For the past 6 years, you have read of its leadership, and today, we offer you the PEAK OF TIMING MACHINES. **$250.00 less 2% for cash.**

$25.00 PER MONTH 10 MONTHS TO PAY

HENRY PAULSON & CO. 37 South Wabash Avenue CHICAGO, ILLINOIS

The Repair Department

By HARRISON F. BABCOCK

Harrison F. Babcock

I presume it could be easily said that I am prejudiced when I state that the sale and servicing of watches is the back-bone of the jewelry business, nevertheless I believe this is a true statement. There are very few people who ultimately purchase watches who do not go into a jeweler to get his opinion before making the final decision and the jeweler is slowly awakening to the part the watchmaker is playing in the success of his store.

The general manager of one of the large jewelry stores in the country made this statement, "Do not have a layman in your repair department taking in the work but have a watchmaker who knows his business. We have tried it out here and are convinced of the importance of it. It has eliminated a good many headaches for us."

I am not a trained merchandise manager but am a watchmaker working at the bench where it is also necessary to meet the customer and take in the work and my remarks are based on my own observations and experience. Generally speaking, I think you will find the problems in one part of the country the same as in any other so these remarks will be more or less general in scope and apply to either a large or small establishment.

The subject of the repair department may be divided into three parts:

1. Taking in the work.
2. Repairing the work.
3. The credit.

The credit presents the least problem of the three, as I have found that most people come prepared to pay cash upon delivery of the repair work and those to whom it is necessary to extend credit are mostly personal friends. Should there be a great demand for credit, most cities have a Retail Credit Men's Association which usually functions very well and gives accurate credit rating.

The taking in of the work is equally as important as actually doing it, as this phase is a leading factor in the success of the department. The man in the corner should not only be a practical man but be a salesman as well, as one of his first and foremost problems is to establish the confidence of the customer in him. It does not take a person long to find out when a salesman is not familiar with the article he is selling,

FAMOUS WATCHMAKERS COLLEGE OFFERS YOU BIG OPPORTUNITY

Learn watchmaking under expert craftsmen

If you are an ambitious young man over 17 and anxious to enter a fine profession, enroll in the Elgin Watchmakers College. Limited number of openings now available. Hundreds of graduates own profitable businesses. Others make fine salaries as watchmakers for leading jewelers. College is sponsored by the Elgin National Watch Company. It offers intensive shop training under expert Elgin watchmakers. Moderate tuition. Write for full details on this unusual opportunity. Address Dept. E-31.

ELGIN WATCHMAKERS COLLEGE
Elgin, Illinois

you just can't bluff it, and when that confidence is once lost, it is very difficult to regain it. I recall one place where I was employed, we used to receive cylinder watches from the corner marked "roller jewel." In the first place, the cylinder should probably not have been taken in and most certainly not for a roller jewel. You can imagine what a customer really thought when the watch was handed back and an explanation made, particularly by an inexperienced person. Oft times, watches have been taken in by such persons and a price given and when the workman takes the watch down, he finds a considerable amount of other repairing needed which results in the customer being charged a greater amount than was originally given, or else the difference is charged up to the shop and they stand the loss, all of which causes dissatisfaction. All these things could be eliminated by a trained man taking in the work and using a few minutes to examine it. If there is any question as to the condition of the watch, it is better to have it left and taken down completely, submitting the estimate through the mail with a return card which usually brings a prompt reply.

Another important phase of this department is the adjusting of complaints, and we all receive them; we have not reached the stage of infallibility or perfection in the watch repair department. It is here that an intelligent explanation is absolutely essential if we are to retain that customer's confidence. It is necessary to judge quickly whether the complaint is justified or not, for unless a reasonable explanation is given, the longer the argument lasts, the more irritating it becomes and even though you give in, in the end, the customer leaves feeling you tried to put something over on him and you have lost entirely the value of the adjustment of the complaint. Perhaps one of the most difficult complaints to adjust, at least I have found it so, is the breaking of a mainspring two or three weeks after putting a watch in order. I have approached this from every angle that I can think of, but in the majority of cases have run into a stone wall. I have found the most satisfactory way to get around it is to charge enough for the job originally so that you may say, "It is not your fault, neither is it ours, but we will gladly take care of it without charge." This applies to watches that have been out to four or five months, anything over that is not so difficult to explain.

I do not subscribe to the theory that the customer is always right. Any complaints that are not the fault of the watchmaker can be adjusted if there is an intelligent and reasonable explanation given, as the majority of people are fair-minded in that respect. It is only when they suspect there is a lack of knowledge on the part of the one giving the explanation that they rebel. Of course there are exceptions to the rule.

I recall one incident years ago that

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happened in a shop where I was employed. There was an out-of-town visitor attending the horse races who had a very fine split second timer which he left to have a glass replaced. Some of the glass had gotten into the movement. He didn't leave it at the watch counter but handed it to one of the clerks, and, of course, when it was turned into the corner and the glass fitted, they realized the watch wouldn't run. When the customer came in after it, they explained the condition to him, but all he would say was, "It was running when I broke the glass and it's not running now." No one seemed able to make any headway with him and he finally arrived up in the watch shop, where the man in charge tried to explain it to him but without results. Of course, the argument grew more intense as time went on and finally culminated in the foreman saying, "Take your watch and get out of here." To which he replied, "I won't get out of here; the watch was running when I broke the glass and it isn't running now." In order to settle the matter, they took it up with the General Manager of the store and decided it was either a question of calling the police or removing the glass to get rid of him, so they did the latter. Of course, this was an exceptional case, but it furnished us a good deal of amusement.

It is well to notice the defects in watches when they are taken in and point them out to the customers, such as ill-fitting or chipped glasses, poor hands, scratched or cracked dials, smooth or small crowns, loose bows, etc. It not only enables you to get a price for changing these but eliminates complaints after the watch is delivered, as it makes a more thorough or complete job. It also creates the impression that you are interested in that one watch and in giving the customer complete satisfaction.

It is very convenient to have large models of different parts to show the customer, such as staffs and pinions, pallets and forks. Some stores even have running models of escapements, furthermore, they have a magnifying glass to show rusty screws and winding wheels, etc. The Ball Watch Co. used to put out a chart showing large micro-photographs of perfect staffs and jewels, also poorly formed and cut pivots with cracked jewels, illustrating how the ragged edges cut the pivots. All the above things help explain to the customer the condition of his watch and it is very seldom that anyone will refuse to pay for these repairs if he can be convinced that such repairs are necessary. Briefly, the man taking in the work should be:

1. A practical man.
2. Have the personality and salesmanship to gain the confidence of the customer.
3. Should not attempt to force repairs on a customer unless they are needed and he can give a

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reasonable explanation of why they are needed.

4. He should be willing to make a prompt adjustment on such complaints of imperfect workmanship but should insist on a square deal from the customer by requiring that he pay for repairs that are not the fault of the watchmaker.

I received in the mail some time ago an article entitled "The Personal Tester," which can not only be applied to employees but also to employers, and it may be interesting to know how your own score stands. Here is the test, the score is a possible 100:

Does his work improve each year and does he become more valuable to the business? (15 points.)

Will he grasp responsibility and work instinctively, or does he always have to be reminded? (12 points.)

Is he good at interesting customers in merchandise other than just what they came in to buy—that is, does he actually sell or does he just fill orders? (10 points.)

Is he courteous, naturally pleasant, well-groomed, and do customers like to buy from him? (10 points.)

Has he personally been responsible for bringing new customers to the store? (8 points.)

Does he make occasional suggestions for improving the business? (7 points.)

Is his record comparatively free from avoidable errors and actions which have actually lost customers for the store? (7 points.)

Can he sell goods on a quality basis or does he rely largely on price appeals? (8 points.)

Does he appreciate and understand the merchandise you expect him to sell? (5 points.)

Is he actively interested in improving himself? (6 points.)

Does he like to study merchandising trends and talk about them? Does he read trade papers and the informative literature put out by manufacturers? (4 points.)

Are his out-of-the-store activities helpful to the business? (4 points.)

Does he co-operate freely, work well with other people, and is he receptive to new ideas? (3 points.)

Does he have a wide circle of friends and acquaintances who might be prospective customers of the business with which he is associated? (3 points.)

The actual repairing of the work is dependent upon two things: One is getting a price that will allow first-class work, and the other the knowledge and care of the individual workman. It seems that the jewelry business has fallen into a rather vicious practice of giving a set price for repair work regardless of what has to be done. The result has been that one man sets a price and the fellow across the street cuts under him and so on down until the lowest price I heard of was thirty-eight cents.

Of course, it is obvious that as the price goes down, the quality of the work goes with it, as a man can only work so fast with his hands and in order to produce an amount that would be profitable financially, he has to let things go that should be done. The result is that the public, to a great extent, has lost confidence in the ability of the watchmaker. You will note I say, "profitable financially," because it has been demonstrated that such a course is very unprofitable in the long run.

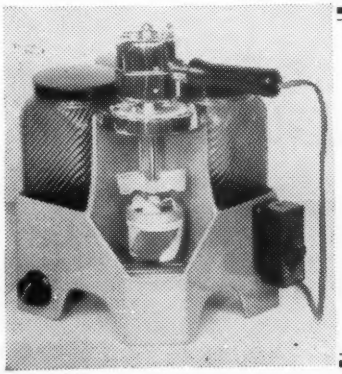
A few years ago a large department store started a watch repair department, intending to operate it under contract. In this contract they had a clause that the work should be done at the established price. I asked the person who showed me the contract what was the established price, and he said he didn't know but would find out. He later told me that he could get a watch repaired anywhere from one dollar to six or seven.

I believe the basic charge for regulating the price of repair work should be the cost of the labor required to do a first-class job, plus the necessary overhead, such as material, etc. Briefly, it is far better to make the job regulate the price than the price regulate the job. The care and knowledge of the individual workman plays a major part in the success of any watch repair department. A man once said to me that the difference between successful and unsuccessful workmen is the pride and care they take in their work. I asked him if he didn't think that knowledge was a factor and he replied, that a man who is careful and takes pride in his work will have the knowledge. The careless and sloppy workman has one idea, that of getting through as quickly as he can and has no desire to improve himself. I had to admit the force of his statement, but yet again there is another factor. While there are a number of watchmakers who are sincere in their efforts to improve themselves, they lack the opportunity for proper instruction and I think the educational work done by all horological organizations and the working out of programs for such instruction, is one of the most encouraging movements for the betterment of the horological profession.

The watchmaker who earnestly desires to improve himself has ample opportunity to do so. At no time within my recollection, since I have been in the business, has there been such concerted effort to disseminate valuable techincal instruction, and I hope this effort will continue.

A few little observations on methods of doing work may be interesting. No doubt they are not new to most of you, nevertheless, there may be one or two little points of value. Of course any extended lecture on the escapement, position work, hairsprings, etc., is obviously impossible, so I will have to make one or two general observations.

In doing successful work, I think one of the most important factors is taking down the watch completely when it is cleaned. I do not think there is any short cut to this that is satisfactory. I have heard workmen say it is not necessary to remove this or take out that and I have even heard them say it is not necessary to take the cap jewels apart. But I have always made a practice of stripping a watch completely and insisted on it when I employed other men, and I believe it has eliminated a lot of trouble. After cleaning the watch and setting it up with the fork left out, I usually oil the train and try it for freedom by putting power on the train about ¼ to ½ turn at a time and letting it run down. If a train is per-



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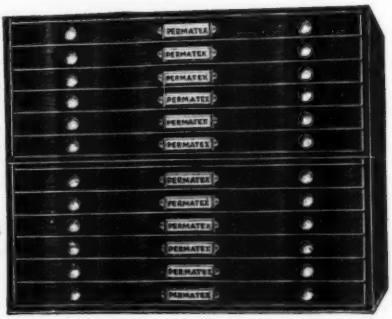

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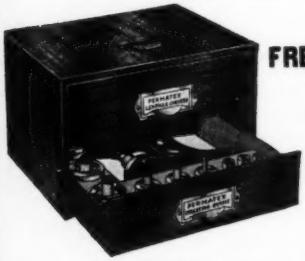

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fectly free, the escape wheel will come to a stop and then reverse itself, turning several times. This is what might be termed back-latching. Of course, there are exceptions to the rule, but it is almost 100% true in jeweled watches and in a majority of cases, it is true of 6 and 7-jewel movements. If I find a train does not back-latch, I investigate and endeavor to make it do so. As I said, there are exceptions, but I try and satisfy myself that it is an exception.

In assembling the escapement and the balance, it is well to try the watch first with the hairspring off. This will give you valuable information in regard to the escapement and the balance. The action of the escapement and the roller action can be seen much better and it can be tried for freedom of the pivots. A pocket watch should ½ time, or run without the hairspring lying flat on either pivot; if it does not, the escapement and pivots should be investigated. While a pocket watch will ½ time in the flat position, it will not do so on edge, but you can tell by the impulse the balance receives from the escapement whether it is free or not. This half time is always true of pocket watches but not of bracelet watches, particularly the very small ones, as oftimes the lock on the escapement if very strong and the balance is too light to unlock it. In this case, you can tell by the freedom of the balance whether there is anything holding it up.

One of the most difficult things to find, especially in bracelet watches, is when the tip of the fork is rubbing against the hub of the roller. There is no way of seeing this, and it is only by testing the watch on edge, with the hairspring off and watching the action of the balance, that I have been able to locate this trouble. If the balance is free on edge and the watch half times on each pivot lying down, then, if after putting the hairspring on, the watch does not motion up, there is only one place to look for the cause, and I have usually found that the hairspring is rubbing somewhere.

The dialing of the watch is very important, as no matter how well you do the rest of the work, if the dialing is carelessly done, it will ruin the entire job. Of course, there should not be excessive end-shake or side-shake to the hands which would cause them to lock. The hour wheel should be perfectly free on the cannon pinion; I allow enough freedom so it will drop of its own weight, trying it out four points of the dial. The inter-setting and minute wheels should revolve perfectly free on their centers. I usually pay particular attention to the inter-setting wheel as often it binds, and through the dial train, will cause a loss of motion to the balance. Very often in bracelet watches, the hour wheel sets right over the inter-setting wheel, and if there is a little shake in either one, the teeth of the two wheels will lock. Oftimes, this is very difficult to find, as the locking is so slight that even lifting the movement from the case will start it right off before you have an opportunity to trace it.

When a watch does not motion or keep time, and I am looking for the trouble, I am reminded of Sherlock Holmes when he said to Dr. Watson, "Watson, eliminate the impossible and the rest, however improbable, must be so."

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U. S. Purchases of Swiss Watches and Parts Increase

United States imports for consumption of watches, movements, jewels, and parts of watches during the first five months of 1940 were valued at $4,410,088 compared with $2,517,770 for the corresponding period of 1939, an increase of more than 75 per cent, according to the Specialties Division, Department of Commerce.

Imports from Switzerland during the period under review amounted to $4,386,502, or 75.4 per cent more than for the corresponding period of 1939. During the first five months of 1940 watches and movements imported totaled 1,179,670, valued at $3,302,364, of which 1,176,376, valued at $3,297,329, came from Switzerland, an increase of 64.4 per cent in number and 52.7 per cent in value over the corresponding period of 1939.

Total imports of jewels for watches and other instruments were valued at $665,192 for the first five months of 1940 and $254,329 for the corresponding months of 1939. Switzerland supplied 98.3 per cent of these imports, an increase of approximately 161 per cent over the 1939 period.

Watch parts imported during the period under discussion were valued at $442,532, of which $435,012 came from Switzerland. During the corresponding period of 1939 imports were valued at $273,497, with $266,170 coming from Switzerland.

Riveting Staffs

By J. H. BRYANS

Referring to May issue of "American Horologist" article on riveting double roller staffs, will say I rivet all double roller staffs in the lathe. After chucking staff in lathe, see that the balance fits seat on staff properly, then select a drilled round face punch that fits loosely over the staff, tilt the punch slightly and while lathe is rotating, tap the punch with a 2-ounce hammer (the mallet as used regularly is too heavy) till the balance is firm on staff, then use the same size punch, FLAT (drilled) to finish job, you will find a BEAUTIFUL JOB and no damage to staff or balance.

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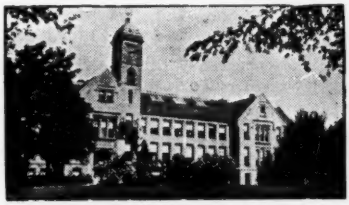

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AERONAUTICAL INSTRUMENT SERVICE

Aircraft Instruments

EDITOR'S NOTE—Aeronautical Instrument Service is a subject untouched by publications in the Horological field, or in fact by any publication. In September, 1938, THE AMERICAN HOROLOGIST inaugurated such an educational service via prepared illustrated lectures to be used by U. H. A. A. organizations for the purpose of broadening our members' scope of knowledge in this field, which offered additional remuneration to those far-sighted enough to avail themselves of such knowledge.

ARTICLE NO. 11

(Continued from July Issue)

Venturi-Pitot air-speed tube.—The Venturi-Pitot pressure tube is shown in Figure 33 ①. The Venturi is a trumpet-shaped tube with a side tube leading out from the narrowest part which is called the throat. This pressure tube is so mounted on a strut that the axis of the Venturi is parallel to the line of flight and that the smaller end is directed forward. The speed of the air is very much greater in the throat than at the forward or the rear end, and also higher than the speed of the air outside. Bernoulli's principle of hydrostatic flow applies here; that is, the pressure decreases as the speed increases. Consequently the Venturi produces a pressure lower than atmospheric pressure, or a suction. For a given length of Venturi the amount of reduction of pressure, or suction, depends on the diameter and angle of the upstream cone, the diameter and length of throat, diameter and angle of the rear cone, and the amount of the bell of flare. After a vast amount of experimental work, a Venturi has been produced in which the amount of suction varies as the square of the speed, just as the dynamic pressure of the Pitot tube and the magnitude of the suction is about four times the pressure of the Pitot. By combining a Venturi and Pitot into one pressure tube, a pressure difference which is five times as great as the Pitot alone gives is obtained. This makes it possible to use a much more rugged instrument for the indicator. The equation for the Venturi-Pitot is

$$V = 17.88 \quad V h$$

where **V** is the speed in miles per hour and **h** is the pressure in inches of water. The Venturi side of the tube is connected through one-quarter-inch copper tubing to the connection nipple marked **S** (suction) on the indicator. The Pitot side is connected to the nipple marked **P.**

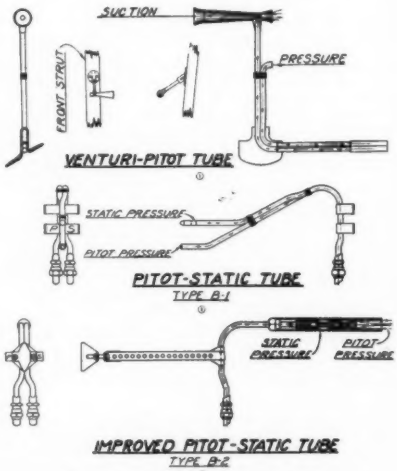

Fig. 33—Air- Speed Indicator Tubes.

Pitot-static air-speed tubes.—(1) The Pitot-static tube, shown in Figure 33 ②, consists of two tubes. The lower tube delivers the dynamic or Pitot pressure (that caused by the impact of the air) to the indicator; the upper, the static pressure (pressure of still air). The dynamic open-

ing is at the tip end of the Pitot. The dynamic pressure results from the slowing up of the air stream directly in front of this opening. The static tube is closed at the tip end, but has a row of holes in its side about three-fourths inch from the tip. Since these holes are at right angles to a surface which is parallel to the air stream, no impact pressure is produced in the static tube, but the pressure within it is atmospheric for the locality in which the aircraft is flying. A line of air-tight copper tubing leads from the dynamic tube (Pitot) to the nipple marked **P** (pressure) on the indicator, and another runs from the static tube to the nipple marked **S** (static). The pressure in the dynamic tube, when directed into a stream of air at any velocity, is given by equation

$$V = K \quad Vh$$

where **V** is the speed in miles per hour and **h** the pressure in inches of water column, and **K** is a varying amount depending on the Pitot pressure. For some time the value given to **K** was 45.2, but it was later found that **K** is not a constant amount due to the compressibility of air which becomes greater as the Pitot pressure increases or, in other words, as the velocity increases. Corrected values for **h** for different values of **V** have been worked out, taking into account the compressibility for different pressure, and a table of corrected values appears in Table V. It is proper to refer to this tube as Pitot, dropping the **static.** The Pitot tube has some very marked advantages over the Venturi-Pitot. It is almost free from errors resulting from slight deposits of dust, oil, water, or ice. The Venturi tube is decidedly not. The Pitot tube is also subject to much less error due to faulty alignment with the air stream.

A new type of Pitot tube shown in Figure 33 ③ was designed by the Air Corps Material Division. This tube has marked advantages under adverse weather conditions such as freezing, rain, snow, etc. It has been calculated from experiments run on this tube that an aircraft would be forced down due to the weight of ice upon it before the end of this tube would be completely closed by ice or snow, and the tube will function giving a correct air-speed reading until the end is completely closed.

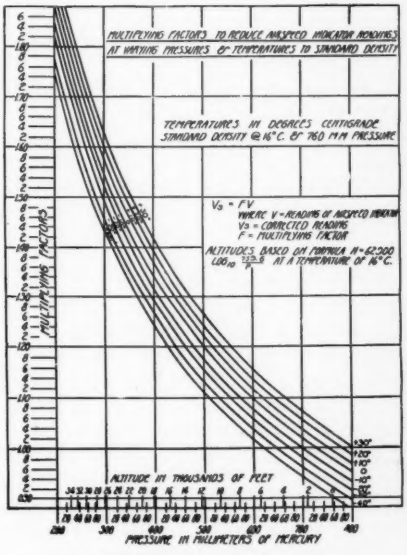
MULTIPLYING FACTORS TO REDUCE AIRSPEED INDICATOR READINGS AT VARYING PRESSURES & TEMPERATURES TO STANDARD DENSITY
TEMPERATURES IN DEGREES CENTIGRADE STANDARD DENSITY @ 16°C. & 760 M/M PRESSURE
$V_0 = FV$
WHERE V = READING OF AIRSPEED INDICATOR
V_0 = CORRECTED READING
F = MULTIPLYING FACTOR
ALTITUDES BASED ON FORMULA H=62,200 LOG10 29.9 / P AT A TEMPERATURE OF 16°C.
MULTIPLYING FACTORS
ALTITUDE IN THOUSANDS OF FEET
PRESSURE IN MILLIMETERS OF MERCURY

Fig 34—Air-Speed Correction Charts.

Altitude correction.—Air speed indicators of the dynamic type are calibrated for the density of the air at a pressure of 29.92 inches and a temperature of 16° C. The density increases as the temperature decreases, and decreases as the altitude increases. The curves shown in Figure 34 give the correction factors for temperatures of —40°, —30°, —20°, —10°, 0°, +10°, +20°, and +30° C. For other temperatures, the value may be obtained by interpolation. Table III gives the approximate values of the correction factor for various altitudes and a temperature of 16° C. Such a table is useful in es-

timating the true air speed for navigational purposes. For careful testing work, the correction curves of Figure 34 should be used.

Table III.—Correction factor for air-speed reading at a temperature of 16° C.

Altitude (feet)	Correction factor[1]	Altitude (feet)	Correction factor[1]
2,000	1.035	12,000	1.24
4,000	1.07	14,000	1.28
6,000	1.11	16,000	1.33
8,000	1.15	18,000	1.38
10,000	1.195	20,000	1.43

[1] Multiply V, by this factor.

Note that roughly 2 per cent of the indicated reading should be added for each 1,000 feet of altitude. Generally, the indicated air speed is less than the true air speed. Sometimes in flying near sea level during cold weather when the barometer is high, the pressure is greater than 29.92 inches of mercury; consequently, the indicated air speed is too high. While it is necessary to make this **density correction** whenever the air-speed indicater is used in navigation, it should not be made when the air-speed indicator is used for handling the airplane. The best rate of climb, excessive stresses at high speed, and stalling are dependent on the impact pressure of which the indicated air speed is a measure without any density correction.

There are several types of air-speed indicators used in the Air Corps. They are listed in the following table:

Table IV.—Types of air-speed indicators:

Type	Range in miles per hour	Pressure tube
E-1 (formerly M1923)	0-80	Pitot-static
A-1 (formerly type B)	0-160	Venturi-Pitot
A-2 (formerly type E)	0-160	Venturi-Pitot
A-3 (formerly type H)	0-160	Venturi-Pitot
13-1 vertical scale	0-160	Pitot-static
C-1 round dial	0-250	Pitot-static
C-2 vertical scale	0-250	Pitot-static
D-2 round dial	0-350	Pitot-static

Construction of type A-2 air-speed indicator.—Type A-2, Figure 35, has two metallic bellows. An arm on each bellows is linked by a bar **a** to a sector gear **b** which engages a pinion on the pointer shaft. As both bars are linked to **b,** both bellows must move together; but the two bars have different angular positions which are adjustable relative to **b**. The magnifying ratio can thus be varied. Two spring stops, **c** and **d,** are engaged by stops on the bellows, **c** being engaged

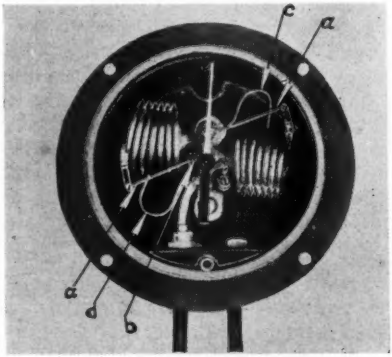

Fig. 35—Type A-2 Air-Speed Indicator.

first and then **d.** These spring stops increase the elastic forces opposing the pressure on the bellows in the upper part of the scale and, thus, make a nearly uniform scale possible. This scale is more nearly uniform than that of any other air-speed indicator. The case enclosing the mechanism is perfectly air-tight, for even a slight leak would seriously affect the accuracy of the instrument. In most instruments, the Venturi is connected to the diaphragm box, or boxes, and the Pitot is connected to the case. It is usually necessary to include some damping device such as capillary tubing or baffle plates in the connecting tubes to prevent the excessive oscillations of the pointer due to gusts. If the Venturi instead of the Pitot is connected to the case, the oscillations are considerably reduced.

Construction of type A-3 air-speed indicator.—The internal mechanism of the type A-3 indicator is shown in Figure 36. In this instrument, the pressure from the Pitot is applied to the case, and the suction from the Venturi is applied to a bellows of two compartment **a.** The case is air-tight and no air is forced into it or drawn out of it except the small amount necessary to produce the pressure difference between the inside of the case and the inside of the bellows.

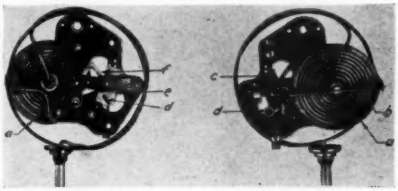

Fig. 36—Type A-3 Air-Speed Indicator.

Mechanism.—The front diaphragm at the bellows, which is connected to the suction nipple by a coil of capillary tubing, is fastened to the frame. To the center of the back diaphragm of the bellows is fastened a bar **b,** having its outer end fixed to a flat spring mounted on the frame and its inner end joined by a pin to a lever of the regulator shaft **c.** The regulator upright **d** extends through a hole in the frame, its upper end, which has the form of a ball, moving in a slot in a plate **e.** This plate **e** is mounted on the same shaft as the sector gear **f,** which engages the pinion of the pointer shaft. A hairspring on the pointer takes up backlash between the linkages. Proper tension on this hairspring is very important in preventing vibration of the pointer because there are so many joints at which lost motion may occur, and may mean the difference between a satisfactory instrument and one almost worthless.

Operation.—On account of the pressure difference between the inside of the case and the inside of the bellows, the latter collapses and the motion of the rear diaphragm is transmitted through the mechanism to the pointer. The motion is magnified by the levers involved. The purpose of the ball and slot is to make the scale uniform by changing the magnifying ratio. Since the pressure is proportional to the square of the speed, and the motion of the back diaphragm of the bellows is proportional to the change in pressure, the motion of the pointer should be proportional to the square of the speed unless some provision is made for decreasing the magnifying ratio. The scale obtained by this device is not altogether uniform, but is open in the most used part of the scale, from 50 to 130 miles per hour.

Dampening.—The coil of capillary tubing between the suction nipple and the bellows is used to damp out rapid changes in pressure, which cause oscillations of the pointer.

Construction of type A-1 air-speed indicator.—The internal mechanism of type A-1 is similar to that of type A-3. It consists of one bellows of two compartments and the ball and slot device for varying the magnifying ratio and obtaining a uniform scale.

Construction of vertical scale air-speed indicator (Pitot).—This is a typical Pitot-static instrument. It was shown in the preceding paragraphs that the pressure derived from a Pitot tube is comparatively small. This fact necessitates the use of a very sensitive diaphragm. Figure 37 shows the front view and the mechanism of the indicator. The slack diaphragm **A** is of oiled colon leather (goldbeater's skin). The chamber behind it is connected to nipple **P.** The case is air-tight when the cover is in place and communicates directly with nipple **S.** When mounted on an airplane, the nipples are connected as described in paragraph 24 to the Pitot tube. The light aluminum disk is fas-

tened to the diaphragm to distribute the load. As the pressure back of the diaphragm increases, a pin is forced against the leaf spring **B,** deflecting the arm **C** and thus rotating its axle. This rotation is transmitted through a simple toggle, which does not appear in the illustration, to the pointer arm **D.** Hairspring **E** opposes the rotation, and serves to take up any backlash and to steady the point-

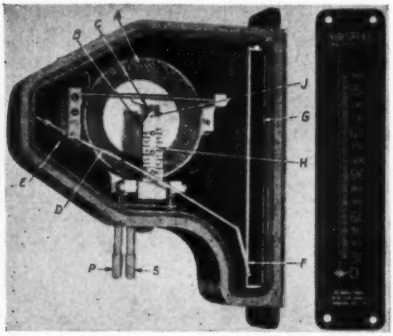

Fig. 37—Vertical Scale Air-Epeed Indicator (Pitot).

er. Pointer **F** is pivoted to arm **D,** guided by wire **G,** and deflects from zero on the scale in proportion to the air speed. To obtain uniformity of the scale, frame **H** is provided with a series of adjustment screws that are adjusted to intercept spring **B** during its deflection, progressively shortening its effective length. By this means the deflections due to the V^2 law, which governs the speed-pressure relation, are converted into directly proportional ones. Screw **J** is directly over the diaphragm pin. It serves to protect the transmitting mechanism and pointer against over-pressures. Arm **C** can be bent slightly to vary its effective radius, thus obtaining sensitivity adjustment.

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Courses for Success for WATCHMAKERS ENGRAVERS, JEWELERS
Write for free book "Your Future and Our School"
JOHN J. BOWMAN, Director
Bowman Bldg., Lancaster, Pa.

Kansas Horological Association CORRECTION

Page 17, the July issue, mistaken identity. The state treasurer is Mr. Howard C. Rhea of Topeka instead of H. D. Howard. Our apology.

Miss Kay Ann Gotorth, McPherson, Kans. The little lady was star attraction at Kansas State Convention, Salina, Kans.

President-Elect Willkie

Did you know that President-elect Willkie does not carry a watch? Say Willkie friends: "He is too busy making the time count, to count the time."

Information, Please

Starting with the September issue a new feature will be started in THE AMERICAN HOROLOGIST known as INFORMATION, PLEASE, dealing with technical problems. Send your questions to this department.

Watchmakers' Association of New Jersey, Inc.

Held their regular state elective convention July 11, Elizabeth, New Jersey.

The regular order of business followed and after the new officers were elected and took their chairs, it was regularly moved and passed that their first state president, Mr. Doehrman, be awarded a life membership.

Harry VanLaar, President

Wm. C. Smith, Secretary

The officers elected for the ensuing year were:

President, Harry Van Laar, Irvington, N. J.

Vice President, Walter Rentner, Trenton.

Secretary-Treasurer, Wm. C. Smith, Irvington.

Trustee, James Hoffmeier, Plainfield.

Director, Peter Bea, Newark.

The state convention will be held October 20 at the Essex House, Newark, New Jersey. This promises to be a gala affair with prominent national and state speakers. The evening will be climaxed with a dance, which also promises to be a huge success.

William C. Smith,
Secy-Treas.

Martin Gluck and Son
SUPPLY SPECIALISTS TO THE TRADE
Clark Building Pittsburgh, Pa.

Essex County Guild No. 2 of New Jersey

Held their regular meeting June 27. Regular order of business, then election of officers. The following officers were elected to head the guild for the ensuing year:

President, Harry Van Laar.

Vice President, Andrew Stroehlein.

Secretary-Treasurer, Frank Manning.

Trustees, Peter Bea and Benjamin Dudkin.

Delegates for the State Convention were: Harry Van Laar, Andrew Stroehlein, Peter Bea, Herman Bernstein, Walter White, William Smith.

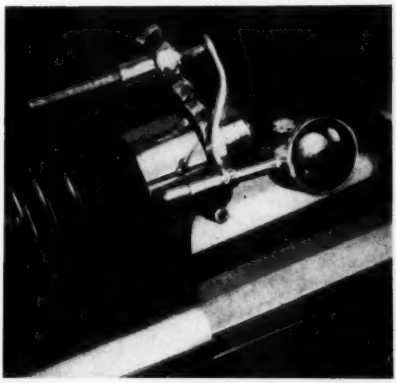
The alternates were: Alfred Seeler and Paul Ginter.

Mr. Peter Bea was re-elected State Director.

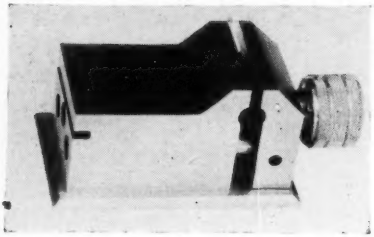
Frank Manning, Secy.

Tools by Horologist

Cover page photos: A small micrometer mounted for use on bench and lathe. Truing and poising calipers of unusual and practical design. both tools by Mr. J. H. Bryans.



Lathe loup of exceptional power. Indispensable, by J. H. Bryans.



A precission bench vice of stainless steel designed for permanent attachment or as a bench vice and block, a much-needed accurate tool, by Cleveland Horologist.

Presto Hand Remover

A new tool which meets an increasing demand for a practical hand and cannon pinion remover. Invented by a Horologist and distributed through Newall Mfg. Co., by all jobbers, (see page 11).

New Paulson Time Michrometer

Paulson announces his new Crystal Control direct instant reading, split-second accuracy, time michrometer, and a new power of accuracy.

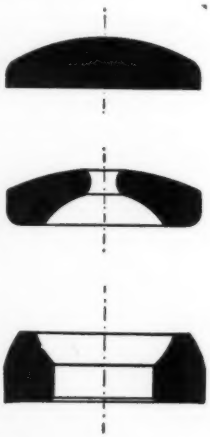
Paulson, for the past several years, has been improving his time michrometer and now feels that the peak of perfection has been attained. No master watch, no winding, no fork, no tuning, no pendulum, no bother. You have a permanent accurate crystal control with dial readings beyond compare.

Full information from Henry Paulson and Co., Chicago, Illinois.

Hamilton Watch Declares Third Quarter Dividend

The Hamilton Watch Company of Lancaster, Pennsylvania, announces its third quarter dividend of $1.50 per share on Preferred Stock payable on September 3rd to shareholders of record August 16th, and 25 cents on Common Stock payable September 16th to shareholders of record August 30th. The watch company's estimated net income for the six months ended June 30th was slightly more than double last year. Earnings were indicated at the rate of $6.13 per share, Preferred, as against $2.74 for the corresponding period last year. After payment of Preferred dividends, a balance of 27 cents per share was available for Common Stock.

There are many sorts of Friction Jewels!



Seitz Jewels Are Unique and To Be Had in One Quality Only!

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Does It Pay To Give Your Best

(From "The Loupe" Chicago Horological Guild)

About this time of the year, when most watchmakers are complaining about the fact that they have no work to do, it is interesting to find a few horologists that have more than they can handle. But why, you may ask? And, that is just the question I asked a fellow horologist, to which he meekly replied, "Sometimes when I get a hard job in, and really work and worry to give my best, I wonder if my efforts will pay dividends, and when, but when the other fellow's business is down and I'm still working, I know my efforts have not been in vain, for my best is not too good at any price."

Samelius takes three weeks vacation to Boston and Maine. Of course, several days at Cape Cod for fishing will be included.

Bill does not want to hear about or from any watchmakers—especially National office—for three weeks.

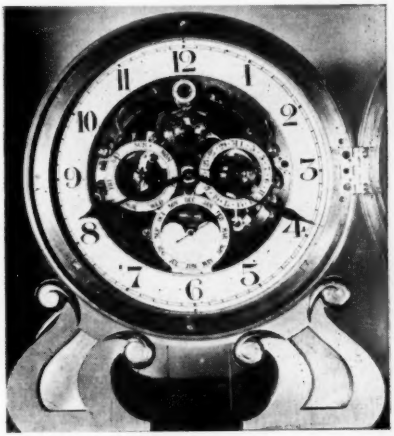
Calender Clock Extraordinary

A detailed description of the Perpetual Calendar Clock made by Charles K. Johns, which is on exhibition in the Hall of Inventions at the New York World's Fair.

By BENJAMIN MELLENHOFF

One of the things most in the public eye today is the question of the nation's resources in the mechanical skills needed in the upbuilding of national defense. One of the most necessary among these skills is that for the designing, construction, and repair of various instruments for military and naval aviation and other service branches. Much of this skill is quite similar to that of the watchmaker. So, any outstanding example of horological work made in America is important now, not only as proof of the maker's ability in this important field, but as an inspiration to others of our horologists to develop their potential ability to the highest degree possible.

An example of the kind referred to is the exceedingly well-designed and accurately made perpetual calendar clock just completed by Charles K. Johns, a watchmaker of New York



City. Hitherto, such works have been mostly the product of the brains and hands of European masters, but now Americans can feel gratified that a fellow-countryman has produced a piece of work not only of this class, but in some respects superior to anything yet made anywhere in the world.

Some idea of the appearance of this masterpiece is given in the illustrations, but no picture can convey a true idea of the beauty of its workmanship and design. It must be seen to be understood and appreciated. The clock can now be seen in the Hall of Inventions at the New York World's Fair.

Both clocks and watches have long been made with calendar mechanism. Simple calendars have a dial-circle with 31 numbered spaces and a pointer to indicate on this the days of the month. At the end of the

month the almanac must be consulted, and in each 30-day month the calendar pointer has to be moved by hand to skip one day to the first day of the next month. This must also be done to skip three days at the end of February, except in each year that is divisible by 4, which are leap years, when two instead of three days are jumped to give February 29 days. At the other irregularly recurring month-ends, the pointer is allowed to move itself from 31 to the 1 for the first day of the next month. This was the earliest form of calendar applied to timepieces since the adoption of the Gregorian calendar.

The next improvement was a mechanism that automatically moved the pointer each month-end to the correct date for the first of the next month, which requires no manual correction except every fourth year for the leap year. Still later was added the feature that automatically adds a day to February in each leap year; this mechanism is the so-called perpetual calendar. This requires no setting as long as the timepiece runs during a century; but at the end of a century, the calendar must be set to omit the 29th of February, except at the end of any century the date year of which is divisible by 400, when February is allowed 29 days.

In the clock made by Mr. Johns, not only does the clock indicate automatically, without manual setting, the correct dates for the ending and beginning of every month in the year, but it adds a day to February every fourth year, and omits the leap year day at the end of each century which is not divisible by 400. There are additional dials indicating the names of the months and of the days of the week; a dial that shows all during any year whether or not it is a leap year; and the annual month dial has an aperture through which is seen a gold disc showing the configuration of the moon in its periodic phase changes.

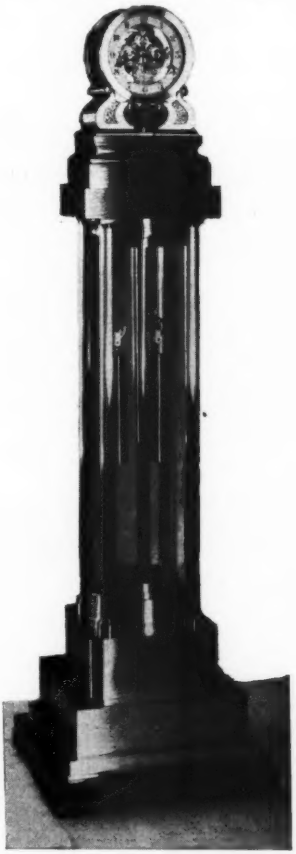
Every part throughout that has any frictional motion is jeweled. There are 110 ruby and sapphire jewels, made outright or reshaped and finished by the maker of the clock. Thus, the implication of infinite durability called for in a clock running in cycles of four centuries each is well met with in the construction of this piece of work. There are more than one thousand separate parts in the clock. Every part of both movement and case was designed and made from raw materials by Mr. Johns except two heavy glass sections in the case.

Think of this great work as an assembly of mechanisms made to progress in motion for four years, and then at midnight of a predetermined day every four years operating to add a day to a specified month; to further progress for one hundred years, and at midnight of another predetermined day every four years operating to add nial action! A romance in mechanical action, indeed!

Mr. Johns is not a clockmaker by profession; he is a watchmaker, which may have decided his choice of a balance and hairspring for the timekeeping element of his clock, instead of a pendulum. However, the power is from two weights—one to drive the time and calendar work, and the other striking the hour and half-hour, which is sounded on a mellow chime tube. The various dials, on two opposite sides of the clock, are on silver circles which leave most of the area open to show the intricate mechanism in action.

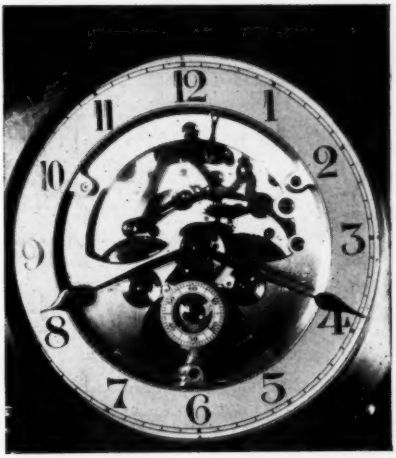
The horologists of America may well feel a sympathetic pride in this achievement of one of their fellow-craftsmen. Not only is Mr. Johns an American by birth and ancestry, but all his training and experience have been in our own country. Born in the college town of Gettysburg, Pennsylvania, his parents desired to educate him for some profession. However, he felt a much stronger

inclination for mechanical work, and was placed as an apprentice with a local jeweler. Feeling in time that he needed more thorough instruction, he entered the Bowman Technical School at Lancaster, Pennsylvania,



and completed its regular course in watchwork. For several years thereafter, he was connected with leading jewelry firms in Philadelphia and New York. At present, he specializes in repairing high-grade, complicated Swiss watches, and in making and repairing scientific instruments. He resides at 790 Riverside Drive, New York City.

When we consider the wonders of this "machine age," when so many things for our use and enjoyment are mass-produced instead of made by craftsmen, it expresses very shallow thinking indeed to say that the day



of the craftsman is done. The machine and its operator can accomplish nothing whatsoever until the creative artist has made something for them to reproduce. It may be surprising to many to learn of the wonderful part played by watchmakers as inventors in the very creation of the modern industrial system itself. According to historical authority, the inventions of the steam engine, the steam locomotive, the steamship, the sewing machine, and the linotype are among the many credited to men who started their careers as watchmakers.

The clock made by Mr. Johns fully represents craftsmanship as distinguished from mechanical mass production. He made it with the simple basic tools that can make the greatest variety and highest quality of work of all, WHEN USED BY A MASTER CRAFTSMAN. In such work it is the man, rather than the tools, that commands our admiration. The world can never do without such men.

Oil

In the June issue of The American Horologist I was particularly interested in the article referring to the oil manufactured by the Shell Oil Company which the Shell people claim to be O. K. for watch lubrication.

A local Shell dealer recently brought into my repair department one of the watches manufactured for the Shell Company and oiled with the Shell oil. The watch was quite new but had stopped.

I could find no cause for its stopping except that it needed oiling. I reoiled the movement with watch oil and this seemed all that was required to start the watch running again.

I jokingly told him I guessed I would continue using the oil that was good for more than a thousand miles.

Yours truly,

F. B., Michigan.

Notice to Rocky Mountain Region Watchmakers

Important—Hold this date open, September 29, 1940; Place, Shirley Savoy Hotel, Denver, Colorado.

It's the 1940 convention of Colorado watchmakers, new displays, new watch models, new materials, new tools. Watch for the details in next month's magazine.

D. Brown, Convention Chairman.

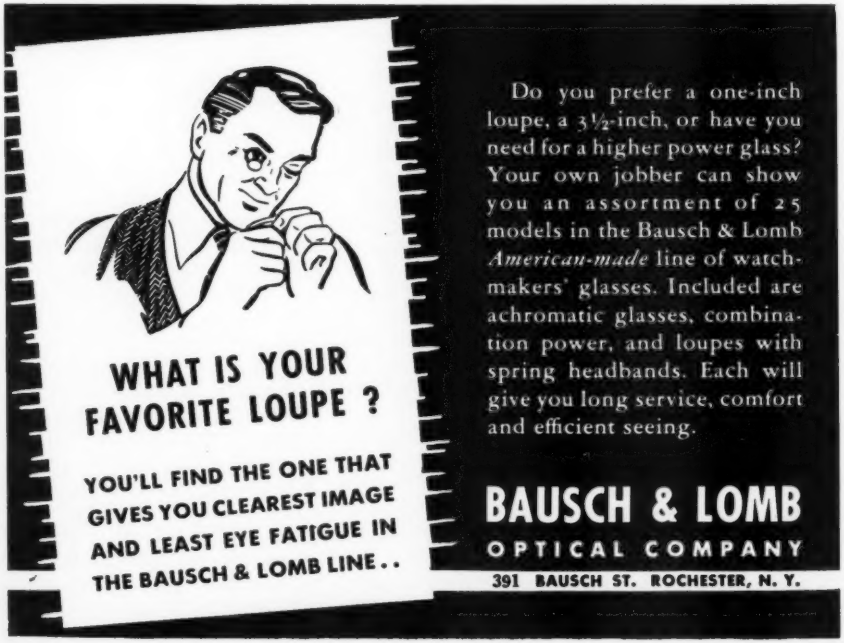
Central Missouri Horological Guild

Held their regular meeting July 18, Columbia, Missouri.

Two new members were enrolled and a very interesting meeting was had, with entertainment and motion pictures.

Next meeting will start our educational features with the subject of Friction Jeweling.

Clinton Holt, Secretary.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YOU'LL FIND THE ONE THAT GIVES YOU CLEAREST IMAGE AND LEAST EYE FATIGUE IN THE BAUSCH & LOMB LINE..
Do you prefer a one-inch loupe, a 3½-inch, or have you need for a higher power glass? Your own jobber can show you an assortment of 25 models in the Bausch & Lomb *American-made* line of watchmakers' glasses. Included are achromatic glasses, combination power, and loupes with spring headbands. Each will give you long service, comfort and efficient seeing.
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Tulsa Guild

Tulsa Guild will hold a picnic the last Thursday in August, at which the members, their wives, children and friends will be invited.

It is expected that this picnic will be twice as heavily attended as the one held last year.

Cincinnati Guild

The Cincinnati Guild held its meeting July 12th instead of July 5th on account of the July 4th holiday.

Twenty-five members were present. Mr. Foegler used the blackboard to draw and lay out an escapement. This type of educational work will continue with each meeting.

We will hold our annual picnic September 24th at Mt. Airy Forest.

Mr. Elmer G. Fisher is the proud father of a baby girl born June 29th.

Elmer G. Fisher,
Corres. Secy.

Worcester Guild Leads Massachusetts Again

Mrs. Ralph A. Jacques was elected president of the newly formed ladies' auxiliary at a meeting of Worcester Horological Guild July 1st in Hotel Aurora. Winfred D. Hebert presided.

Other officers elected and installed by William H. Bright of Boston, national vice president, were Mrs. Chester J. Laverty, vice president; Mrs. Gustav H. Hanson, treasurer, and Miss Cecile C. Hebert, secretary.

Chester J. Laverty, chairman of the committee for the annual clambake to be held in August at Tatassit Beach, Shrewsbury, reported more than 200 were expected. Assisting him are William E. Hebert and Henry Lavanture.

Ralph A Jacques won the attendance prize. The next meeting will be held August 5th.

J. Edward Bogage,
Secretary.

Los Angeles Guild

The Los Angeles Guild members are going to register their repair marks with the local police.

This is a most commendable action and fits into the national scheme which will soon be announced in connection with our cooperation and departments to F.B.I.

Elgin at the Fair

A rare combination of brilliance and beauty is the keynote of the Elgin National Watch Company's Watch Observatory at the New York World's Fair this year. Typifying this theme are eight intelligent and beautiful girls. Four are attractive United States college graduates, who are also winners of Phi Beta Kappa scholarship awards, and the others were picked from North and South American contestants to form the Elgin Pan-American Court of Beauty.

The American girls were selected from among 500 winners of the highest scholarship awards in the country. Their feminine comeliness disproves the old superstition that smart girls are ogreish, shapeless bookworms, and they compare favorably with the cream of Canadian and Latin-American beauties with whom they are appearing. The list includes Eulette Francis, Birmingham-Southern College; Melba Rae Toombs, Leland Stanford University, who, incidentally, is also the official emissary from Treasure Island Fair in San Francisco; Rita McGuane, University of Chicago, and Betty Moore, William and Mary College. Sheila Scott of the University of Toronto was the Canadian winner. The South American girls, all of whom speak English and have college educations or the equivalent, are: Flora R. Chacoli, Buenos Aires, Argentine; Olga Betancourt, Mexico City, Mexico, and Aline Caracciolo, Rio de Janeiro, Brazil.

All are serving as hostesses at the Elgin Watch Observatory exhibit. They are appropriately dressed to symbolize their charm, their country, and the timekeeping product they represent.

Like the Pan-American Court of Beauty, the entire 1940 Elgin technical exhibit at the fair embodies the finest in skilled performance and artistic perfection. An especially romantic touch is added to the craftsmanship display this year by the addition of an 1803 Breguet French "repeating" watch, which Lady Elgin of Scotland presented to her husband early in the nineteenth century.

The ancient watch is owned by T. Albert Potter, president of the Elgin National Watch Company, and is still a good timekeper, despite its 137 years of age. It is on display with its namesake and modern counterpart, a slender, quiet and graceful "Lady Elgin" watch selected from the 1940 models.

REMEMBER!

SIZE IS NOT THE ONLY CONSIDERATION WHEN CHOOSING A PROPER MAINSPRING UNCHANGING POWER IS THE MOST IMPORTANT QUALITY

THE CONCAVE-CONVEX FORM OF
SANDSTEEL
CROSSCURVED MAINSPRINGS
GIVES THEM MORE POWER
AND
LASTING RESILIENCE
PATENTED—MADE IN U. S. A.

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145 HUDSON STREET. NEW YORK.

Fairest to the Fair

Rita McGuane, left, Chicago, University of Chicago, and Melba Rae Toombs, Palo Alto, Leland Stanford University, two of the beautiful Phi Beta Kappa college graduates representing American girls at the Elgin National Watch Company's Pan-American Court of Beauty at the Elgin Watch Observatory at the New York World's Fair this year. They and three other scholarship winners from United States colleges are competing with a Canadian and four South American beauties for honors as hostesses at the Elgin exhibit. Their costumes typify the intellect and charm for which they were awarded Certificates of Brains and Beauty.

Swartchild Celebrates 70th Anniversary

Swartchild & Co., the world's largest watchmakers' and jewelers' supply house, is currently celebrating its 70th anniversary in business.

The occasion is being recognized in the current August issue of the Black Shield Watchman, the Swartchild regular publication. This issue contains a great number of specially priced bargains and also several

pages of interesting historical information.

Swartchild & Co. was originally established in 1870 by Samuel Swartchild in partnership with Theo. Kearney. The new concern had to survive the destructive Chicago fire and then the "business panic" of 1873. After a few years Samuel Swartchild took over the company alone and devoted his entire life to its welfare and to the general welfare of the jewelry industry.

The Swartchild Company was the "first house in the West" to specialize in watch materials and watchmakers' supplies, and the concern continued to grow right up to the present and now covers the nation with its home office in Chicago and complete distributing branches strategically located in a number of important cities.

Starting in 1894 the sons of Samuel Swartchild entered the business; and starting in 1930 the grandsons, or third generation, became part of the company—so that this outstanding concern is not only celebrating its 70th business anniversary but also can boast of 70 years of management by succeeding generations of the founder.

Hamilton Employees Overwhelmingly favor Co-op Annuity plan; Almost All Sign Up

Anxious to supplement their social security retirement benefits, 99.6% of the Hamilton Watch Company's employees signed up for their own Cooperative Retirement Annuity Plan. The plan, which went into effect on July 1st, affords all employees at 65 years of age an income, which added to the governmental benefit, should assure those with service records a comfortable standard of living during retirement.

The eager acceptance of the plan, which emphasizes continuity as well as length of service, was hailed by company officers as added assurance of Hamilton's stabilized employment. Recognizing that deft manual skill, so essential in watchmaking, rests on years of close association with a specific operation, the management sees the work of a more content, secure employee reflected in a constantly improved product.

KREISLER'S DIRECT-TO-RETAILER SALES REPRESENTATIVES

Gathered together for the joint purpose of the Formal Opening of the new Kreisler Factory and the Mid-Year sales meeting at which new lines were presented are, reading from left to right, seated: Sidney Kane, Jules Hochman, Leonard Lees, Dave Kanow, Lew Kanow, Phil Paul. Standing, from left to right: T. Reed Botts, Henry I. Cohen, Leonard B. Friedman, Murray Greenbaum, Jack Foreman, Dave Stocker, Harry Epstein.

There was some reshuffling of territories for the Kreisler men and two new representatives were added—Murray Greenbaum, covering West Virginia, Pennsylvania (with the exception of Pittsburgh and Philadelphia) and the New York territory in and around Buffalo and Niagara Falls and Maryland west of Baltimore—and Jack Foreman, who will travel Idaho, Montana, Wyoming, Utah, Nevada, New Mexico, Arizona, and Colorado. These newcomers to the Kreisler Sales Force have undergone a thorough training with other Kreisler men for the past six months.

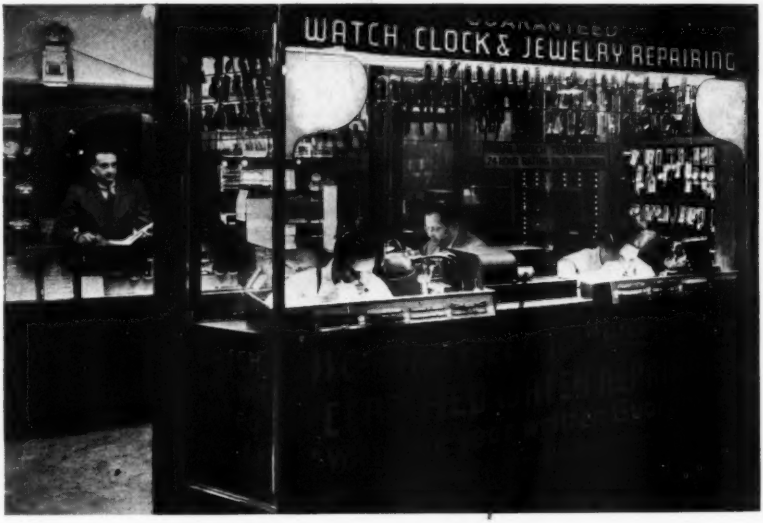
Other switches in the Kreisler Sales Set-up include Baltimore and Washington to Jules Hochman and Nebraska to Leonard Lees, and in Michigan from Lansing east to Harry Epstein.

Two Ultra-Modern Kelton Watches

Ingersoll-Waterbury Company announces two new Kelton 7-jewel wrist watches for men in "Pink Gold" effect, the latest gold color for watches that is sweeping the country.

Drake pink gold will sell to the public at $9.95; Douglas, the "shockproof" wrist watch, at $7.95.

Like all Keltons, these new numbers will sell at fair trade prices to the consumer in all states having fair trade laws.



Viewing the Watch Master from the Customer's Angle

Mr. Paul Friedman, owner of the Terminal Watch, Clock and Jewelry Shop, Hudson Tube, 33rd St. Terminal, N.Y., (above) received a letter from a customer. It read:

"I have shown several friends the charts made by my watch on your machine. They were deeply impressed by them as well as the accuracy of your repair work. You can guess where they will bring their watches when repairs are required."

The Watch Master is a 2-way profit-maker, increasing patronage and reducing watch repair costs. It prints chart records in 30 seconds, showing the 24-hour rate of any watch and indicating the cause of irregularities.

See it at the New York Convention

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Distributors of Western Electric Watch-rate Recorders